COMP90007 Internet Technologies
Week 3 Workshop

Semester 1, 2021

Question 1 (Layers)

- Identify 2 ways in which the OSI reference model and the TCP/IP reference model are the same.

- Identify 2 ways in which these models differ.

  (*NB: You can use the textbook to solve this question*)

Question 2

- Compare wireless networks with fiber networks. What are the advantages and disadvantages of each?

Question 3 (Delay and bandwidth)

- An image is 1600 × 1200 pixels with 3 bytes/pixel. Assume the image is uncompressed.
    - How long does it take to transmit it over a 56-kbps modem channel, assuming zero propagation delay over the channel?
    - Over a 1-Mbps cable modem? Over a 10-Mbps Ethernet?
    - Over 100-Mbps Ethernet? Over gigabit Ethernet?

Question 4 (Topology)

- Consider the following 3 network topologies for connecting N nodes. In the general case of an N node network:

linear

ring

full mesh
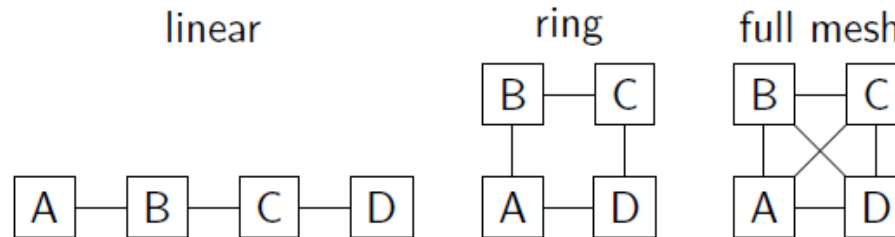
- □ (a) How many links are there in each network?

- □ (b) What is the maximum delay between any pair of nodes, assuming each link has a delay of 10ms, and the shortest path is used between nodes?

- □ (c) What is the minimum number of links that need to be cut in order to isolate one or more nodes?

- □ (d) Which topology would you use to connect military command centres?

Question 5 (Topology)

- Is an oil pipe a simplex system, a half-duplex system, a full duplex system or none of the above? Under which conditions?

Question 6 (Topology)

- List two solutions that one can use for sharing a link between multiple senders and explain these solutions briefly.